

WHAT IS CLAIMED IS:

1. A lithographic projection apparatus comprising:
 - an illumination system to provide a projection beam of radiation;
 - a support structure to support patterning structure, the patterning structure serving to pattern the projection beam according to a desired pattern;
 - a substrate table to hold a substrate;
 - a projection system to project the patterned beam onto a target portion of the substrate;
 - a compartment surrounding a part of a path of the projection beam; and
 - a purge gas system to supply said compartment with a purge gas, said purge gas system comprising a controllable flow restrictor constructed operatively associated with an inlet of said compartment and a controller constructed and arranged to control said flow restrictor to restrict a flow of purge gas when contamination in said compartment is below a threshold level.
2. Apparatus according to claim 1 further comprising a sensor constructed and arranged to detect a level of a contaminant in the compartment or gas flowing out of said compartment and wherein said controller is responsive to an output of said sensor.
3. Apparatus according to claim 1 wherein said controller is adapted to control said flow restrictor on the basis of a timetable based on at least one of empirical data and theoretical calculations as to the amount of purging desired to reduce contamination to below the threshold level.
4. Apparatus according to claim 1 wherein a rate of supply of the purging gas to said compartment when the flow of gas is restricted is less than about 100 l/h.
5. Apparatus according to claim 1 wherein said controller is adapted to adjust the flow restrictor to increase the flow of purge gas after a potentially contaminating event.

6. Apparatus according to claim 5 wherein the potentially contaminating event is selected from the group consisting of: the lithographic projection apparatus being switched off, patterning means exchange, substrate exchange, and an interruption in purge gas supply, contamination of the purge gas supply.

7. Apparatus according to claim 1, comprising a plurality of compartments supplied with purge gas and wherein said flow restrictor is provided in a common part of a supply of purge gas to each compartment, such that the flow to all compartments is controlled simultaneously.

8. Apparatus according to claim 1 comprising a plurality of compartments supplied with purge gas and wherein separate flow restrictors are provided for respective ones of said compartments and wherein said controller is adapted to control said flow restrictors separately or together.

9. Apparatus according to claim 7 wherein said purging gas system further comprises:

a manifold;

a pressure regulator constructed and arranged to supply purge gas to said manifold at a substantially constant pressure;

a supply to each compartment including a flow restriction to determine a flow rate into that compartment; and

an outlet from each compartment including a flow restriction to determine an over-pressure in that compartment, wherein said pressure regulator provides a sufficiently high flow resistance so that a pressure in said manifold remains substantially constant in spite of a variation in flow resistance with respect to said compartments.

10. Apparatus according to any claim 1 claims wherein said compartment include at least one of:

- a compartment in the space between said substrate table and a final element of said projection system;

- a compartment surrounding a chamber containing said projection system;
- a compartment surrounding an element of said projection system;
- a compartment in a space between said patterning means and said projection system;
- a compartment surrounding said support structure for said patterning structure;
- a compartment surrounding a mask handling device;
- a compartment at least partially surrounding said radiation system; and
- a compartment for conveying said projection beam from a radiation source to said radiation system.

11. Apparatus according to claim 1 wherein said purge gas system comprises:

- a first purifier;
- a first valve constructed and arranged to control input of purge gas to said first purifier;
- a second purifier, in fluid communication with an output of said first purifier, purge gas output by said second purifier being supplied to said compartment;
- a second valve for controlling a flow of gas between said first purifier and said second purifier;
- a contamination sensor constructed and arranged to sense a level of a contaminant in the flow of gas from said first purifier to said second purifier; and
- a controller constructed and arranged to operate at least one of said first and second valves in the event that said sensor detects contamination in the flow of gas from said first purifier to said second purifier above a first purifier threshold level.

12. Apparatus according to claim 11 wherein the second purifier is adapted to reliably provide a purge gas output to less than another level of contamination, said another level being lower than a threshold level of said first purifier.

13. A device manufacturing method comprising:

- projecting a patterned beam of radiation onto a target portion of a layer of radiation-sensitive material on a substrate in a lithographic projection apparatus, and

- purging a compartment of the apparatus with a purge gas, a flow of the purge gas to the compartment being restricted using a controllable flow restrictor when contamination in the compartment has fallen below a threshold level.

14. A method according to claim 13 wherein said flow is restricted when a measured level of contamination in said compartment or of gas flowing out of said compartment falls below the threshold level.

15. A method according to claim 13 wherein said flow is restricted according to a timetable.